Amendments to the Claims

Please cancel Claim 4. Please amend Claims 1, 5, 13, 19, 21 and 24. Please add new Claims 25-28. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1.   (Currently amended) A method of imaging an object using radiation, comprising:

from a source located at one side of a generally O-shaped gantry, projecting a beam of radiation into a central opening of the gantry, through an object being imaged, and onto at least one real detector array located on the opposite side of the gantry;

obtaining projection data from the at least one real detector array, the at least one real detector array obtaining projection data at two or more positions on the gantry, and having a geometry that is neither equilinear nor equiangular;

reprojecting the projection data onto a virtual detector array that has a geometry that is either equilinear or equiangular; and

reconstructing the reprojected data from the virtual detector array.

2.   (Original) The method of Claim 1, wherein the at least one real detector array comprises two or more detectors configured to obtain projection data at two or more positions.

3.   (Original) The method of Claim 1, wherein the at least one real detector array comprises at least one detector that is movable to obtain projection data at two or more positions.

4.   (Cancelled)

5.   (Currently amended) The method of Claim 4 1, wherein the radiation comprises x-ray radiation.

6.   (Original) The method of Claim 1, wherein the virtual detector array is equilinear.

7.   (Original) The method of Claim 1, wherein the virtual detector array is equiangular.

8.   (Original) The method of Claim 1, wherein reprojecting the projection data onto a virtual array comprises:

allocating a virtual array that comprises virtual pixels that are equally-spaced in distance or angle;

for each virtual pixel, determining a corresponding real detector pixel in a real detector array that is intersected by a line connecting the virtual pixel to the source of projected radiation; and

using a radiation amplitude value detected at the corresponding real detector pixel to determine a radiation amplitude value for the virtual pixel.

9.   (Original) The method of Claim 8, wherein determining a radiation amplitude value for the virtual pixel comprises interpolating a value from the radiation amplitude values of the corresponding real detector pixel and neighboring real detector pixels.

10.   (Original) The method of Claim 1, further comprising:

filtering data from the virtual detector array; and

backprojecting data from the virtual detector array.

11.   (Original) The method of Claim 1, wherein the at least one real detector array comprises at least one one-dimensional line detector.

12.   (Original) The method of Claim 1, wherein the at least one real detector array comprises at least one two-dimensional flat panel detector.

13.   (Currently amended) A system for imaging an object using radiation, comprising:

a generally O-shaped gantry having a central opening into which an object being imaged is placed;

a source of radiation housed within the gantry;

at least one real detector array that obtains projection data at two or more positions on the gantry, and has a geometry that is neither equilinear nor equiangular; and

a data process for reprojecting the projection data onto a virtual detector array that has a geometry that is either equilinear or equiangular, and for reconstructing the reprojected data from the virtual detector array.

14. (Original) The system of Claim 13, wherein the source comprises an x-ray source.

15. (Original) The system of Claim 13, wherein the at least one real detector array comprises at least one one-dimensional line detector.

16. (Original) The system of Claim 13, wherein the at least one real detector array comprises at least one two-dimensional flat panel detector.

17. (Original) The system of Claim 13, wherein the virtual detector array is equilinear.

18. (Original) The system of Claim 13, wherein the virtual detector array is equiangular.

19. (Currently amended) The system of Claim 13, wherein the at least one real detector array comprises at least two detectors configured to obtain projection data at two or more positions on the gantry.

20. (Original) The system of Claim 19, wherein the at least two detectors are disposed end-to-end, and angled relative to one another to approximate an arc having a radius centered at a focal spot of the source.

21. (Currently Amended) The system of Claim 13, wherein the at least one real detector array comprises at least one detector movable to two or more positions on the gantry to obtain projection data.

22. (Original) The system of Claim 13, wherein the virtual detector array comprises an array of equally-spaced virtual pixels.

23. (Original) The system of Claim 22, wherein the data process reprojects data by assigning a radiation amplitude value to each virtual pixel based upon a measured radiation amplitude value of a corresponding real pixel that intersects a line between the virtual pixel and the radiation source.

24. (Currently amended) A system for imaging an object using radiation, comprising:

means for obtaining projection data from at least one real detector array, the at least one real detector array obtaining projection data at two or more positions, and having a geometry that is neither equilinear nor equiangular;

means for reprojecting the projection data onto a virtual detector array that has a geometry that is ~~either equilinear or~~ equiangular; and

means for reconstructing the reprojected data from the virtual detector array.

25. (New) A method of imaging an object using radiation, comprising:

obtaining projection data from at least one real detector array, the at least one real detector array obtaining projection data at two or more positions, and having a geometry that is neither equilinear nor equiangular;

reprojecting the projection data onto a virtual detector array having an equiangular geometry; and

reconstructing the reprojected data from the virtual detector array.

26. (New) The method of Claim 25, wherein the radiation comprises x-ray radiation.

27. (New) The method of Claim 1, wherein the source and the at least one real detector array are rotated around the circumference of the generally O-shaped gantry.

28. (New) The system of Claim 13, wherein the source and the at least one real detector array

are rotatable around the circumference of the generally O-shaped gantry.